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ECONOMIC ASPECTS OF URBAN SPRAWL

●

A TECHNICAL REPORT

British Columbia

LOWER MAINLAND REGIONAL PLANNING BOARD OF B.C.

MAY, 1956

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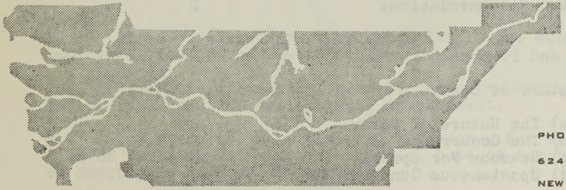
LOWER MAINLAND REGIONAL PLANNING BOARD OF B. C.

J. W. WILSON, S.M., M.R.P., P. ENG., EXECUTIVE DIRECTOR



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NEW WESTMINSTER, B. C.

May, 1956

To The Member Municipalities Of The
Lower Mainland Regional Planning Board:

This study is the technical counterpart of Urban Sprawl in the Lower Mainland of B.C. These two reports cover much the same ground except that this study describes and discusses the analyses in greater detail. It is intended primarily for those who wish to study the problem more deeply than the popular report allows, and for those with a professional interest in the problem.

This study shows how widespread the effects of sprawl are and how many interests are touched by it. If it stimulates a number of people and agencies to do what they can to mitigate a serious problem it will have achieved its purpose. It is with this hope that it is presented to you.

Yours sincerely,

Hughes

S. E. Hughes,
Chairman

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SUMMARY

1. Areas of sprawl are very extensive in the suburban municipalities of the Lower Mainland region.

2. Sprawl is due mainly to scattered urban development rather than genuine small-holding development.

3. (a) There is, nevertheless, a tendency for concentration of building lots into areas which have or can be expected shortly to have urban densities.

(b) Areas of urban density seem to be preferred by the homeowner, since their lot occupancy rate is higher than in areas of lower density.

4. Sprawl is not a temporary or self-correcting condition. Areas presently affected by sprawl will not be developed to urban densities within the next 30 to 40 years. Meanwhile new sprawl areas will have developed farther afield unless steps are taken to halt the process.

5. The cost of supplying sprawl areas with services such as roads, ditches, watermains, sewers, electric power and telephone is high. The cost per household of supplying these utilities tends to drop as densities increase.

6. (a) Farm Areas provide a sizeable tax surplus for the remainder of the municipality;

(b) Sprawl Areas are consistent deficit areas, requiring more in the way of services than they provide in revenue;

(c) Suburban Residential Areas are capable of paying their way or of producing a surplus, provided land and home values remain at normal urban levels and extra services are not too clostly.

RECOMMENDATIONS

Three general principles will lead to solution of the sprawl problem:

1. Active encouragement of compact, self-supporting residential areas.
2. Discouragement of deficit-producing sprawl areas.
3. Preservation of farm lands.

I. It is recommended that urban residential zones of realistic size be established, capable of being filled to urban densities within a relatively short period, say five years.

Relatively high density is only one prerequisite of self-supporting residential development. It must also be:

1. Located on good ground;
2. On lots of adequate size;
3. Of sound construction;
4. Not supplied with extra services which cannot in large measure be paid for directly.

A sound program of capital expenditures should be undertaken in these areas to make them more attractive for residential development.

II. It is recommended that acreage holding zones be established with minimum lot sizes of perhaps 1 acre. Services in these zones should be held to a minimum.

III. (a) It is recommended that farm zones be established in suitable areas with minimum lot sizes of, say 10 acres. (b) The farms included within these zones should be granted tax relief, perhaps by an extension of the exemptions for improvements.

IV. It is recommended that the Provincial Government, while it is engaged in redrafting planning and other municipal legislation, should seek the power to require any municipality to prepare plans on the following basis;

> "That zoning schemes shall be prepare and administered to allow for not more than 5 years' normal residential growth at any time. Such schemes shall be designed to promote maximum economy and efficiency in developing and servicing the area, and no improvements programs shall be undertaken unless related to such a scheme."

V. Detailed solutions, such as the size and location of various zones, will vary from municipality to municipality and can only be effective if based on competent planning advice. Many details, such as capital works planning and the timing of new urban residential zones, can be handled most effectively when planning becomes a built-in municipal function and a municipal planning officer is available on a day-to-day basis.

It is recommended that the municipalities affected by sprawl consider the appointment of a municipal planning officer, or alternatively, that they make full use of the local planning service of the Lower Mainland Regional Planning Board.

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I. SCOPE AND PURPOSE:

The purpose of this study is to examine some economic aspects of urban sprawl, and more especially its effect on municipal finances. The general aspects have already been dealt with in Urban Sprawl in the Lower Mainland, which is for the lay reader. This study is intended primarily for municipal and provincial officials and representatives and others with a deeper interest in this problem.

II. THE NATURE OF SPRAWL:

(a) The Nature of Sprawl:

Sprawl takes many forms, but all forms have one common characteristic - low population density. This characteristic is the basis for the definition of sprawl used in the report: Sprawl is a stage of transition between true agricultural development, which has a density less than 0.3 people per acre, and suburban residential development, with a density greater than 3.5 people per acre. That is, sprawl areas have a density between o.3 and 3.5 people per acre. This is not an arbitrary definition, but one which, as will be seen later, emerged in the course of the survey.

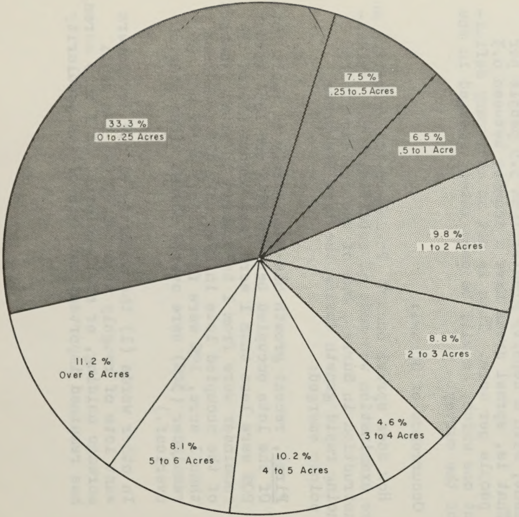
(b) The Occurrence of Sprawl:

How does sprawl occur? To answer this question an extensive examination was made of subdivision and residential construction in Surrey, one of the municipalities experiencing rapid growth during the last few years. Several points emerged:

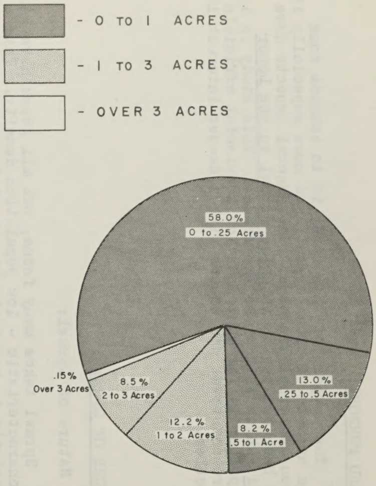
First, recent growth has been mainly on small lots. Of the lots occupied between 1949 and 1954 almost 80% were less than 1 acre, and almost all of the remainder were from 1 to 3 acres in size; whereas of the occupied lots in 1949 only 47% were less than 1 acre, 19% were from 1 to 3 acres and the remainder (34%) were over 3 acres. (See diagram overleaf.)

In other words (1) the majority of new developers want lots of roughly urban size, (2) the small acreage holding, or small-holding, of 1 to 3 acres, has remained important but much of its popularity

LOT SIZES - WHAT DO PEOPLE WANT ?



OCCUPIED LOTS
PRIOR TO 1949



OCCUPIED LOTS
ADDED BETWEEN 1949-54

These charts are based on information from Surrey Tax Rolls

THE LOWER MAINLAND REGIONAL PLANNING BOARD is probably due to the inducements offered by the Veteran's Land Act, which will assist building only on holdings over 1.6 acres in size. Homes established by the V.L.A. in Surrey between 1949 and 1954 represent about 42% of the total lots occupied in this size range.

Second, the predominant type of area development which resulted from all this building was sprawl. In North Surrey* between 1949 and 1954 some 1690 homes were built on lots of less than one acre. At minimum suburban densities (3.5 people per acre) these homes could have developed, in this short period, a suburban area of 2000 acres. Instead the map of gross densities (page11) shows that the total development of North Surrey in all the years up to 1955 resulted in only 1120 acres of suburban development. In Richmond similar results have occurred. In spite of the post-war building boom only a small section in each municipality is urban in character, while areas of sprawl are extensive.

(c) Reasons For Sprawl:

Why should development for predominantly residential purposes produce sprawl rather than cohesive development? A number of reasons suggest themselves:

1. The average man owns a car and is therefore very mobile.

2. (a) In the municipalities studied electric power and water are available or can easily be provided at almost any point; (b) there were few areas with distinctively urban services such as sewers or sidewalks. In other words there was very little advantage in terms of facilities in settling in one area rather than another. In fact the advantage probably lay with the less developed areas where land values tend to be lower.

3. An incredible amount of land has been subdivided on a speculative basis and is thrust at the prospective home builder. For example, in Surrey in 1954 there were 8548 unoccupied lots less than one acre in size, enough by themselves to accommodate the whole of the municipality's growth for more than 8 years.

4. The prospective householder seldom gets a whole, unbiassed view of the field open to him. He has

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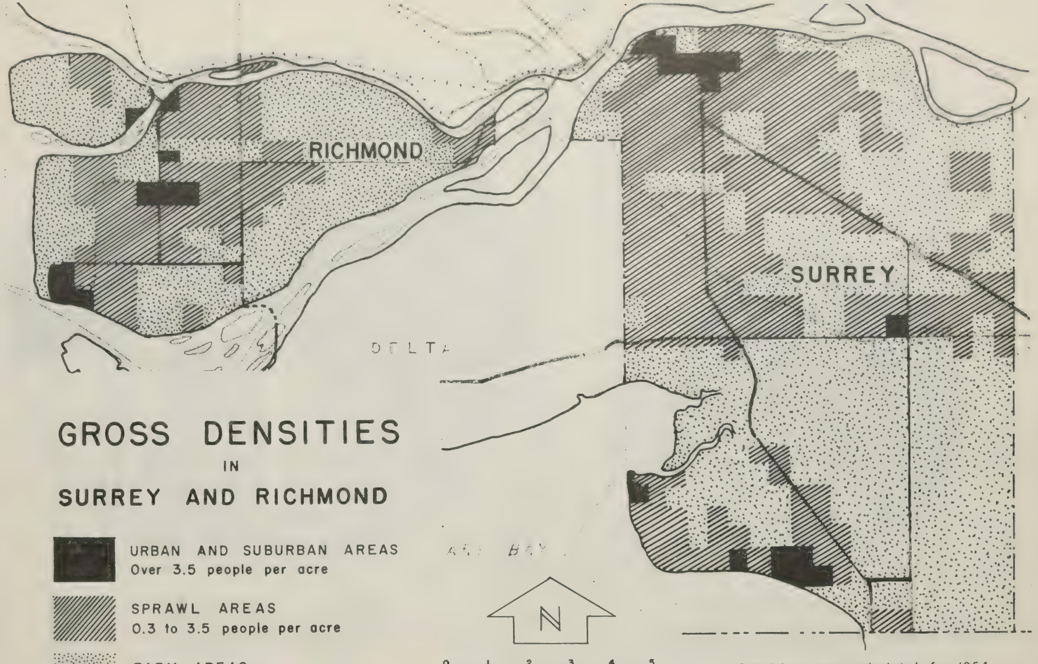
*North of the New McLellan Road, west of the Coast Meridian.



GROSS DENSITIES
IN
SURREY AND RICHMOND

Densities were calculated for 1954 in Richmond and 1955 in Surrey.

to depend on chance circumstance such as the advertisements he may read, the signs he may see in driving, the advice of friends, or what some real estate agent, anxious to make a sale in his own area, may advise him. There is no Consumers' Guide to housing areas.

5. There was no restriction or guidance of residential development through effective zoning, or through loan restrictions.

(d) Spontaneous Concentration:

In spite of what has just been said one most significant thing must be mentioned, namely that in spite of the complete lack of encouraging factors, a considerable amount of concentration of development seems to take place naturally. Of the lots less than 1 acre occupied in North Surrey between 1949 and 1954, 44 percent were located on only 1.75 sections out of a total available of over 50 sections, that is, on 3.5 percent of the land available.

Another indication of the apparent desirability of lots in denser areas is shown by lot occupancy rates. In a sample area, those sub-areas with a density of more than 3.5 people per acre had 65 percent of lots less than 1 acre occupied; those between 1.2 and 3.5 people per acre had 53 percent occupied; and those between 0.3 and 1.2 people per acre had only 32 percent occupied. (See Table A overleaf)

What reasons account for this opposite tendency? These can only be speculative but they might include (1) relative closeness to shopping facilities, such as they are, (2) a natural desire of people to be part of some community, (3) a tendency on the part of speculative builders to build in areas which already seem to be "selling" and in which good loans are likely to be available.

These reasons, both pro and con, are extremely important, since any regulative steps are likely to be much more effective if they can be made to reinforce natural social or commercial forces.

(e) Sprawl - A Continuing Problem:

It may be felt that because of the tendency towards concentration there is really no problem; that development will soon fill the areas of sprawl to urban densities; and today's sprawl will merely be tomorrow's urban area. Unfortunately this is not the case. In 1955 in Surrey, there were 39,150 acres of sprawl densities. To bring these areas to even a low suburban density of 5 people per acre, would require a population increase over and above the present population (45,000) of 145,000, which does not seem likely to happen for some 40 years yet. In other words almost two generations would pass and the present sprawl areas would not be compacted by natural growth. Meanwhile new sprawl areas would have sprung up farther out and the problem would be repeated on a larger scale in a new area. Sprawl is not self correcting.

* * * *

TABLE A

Development Density and Lot Occupancy Rates

Square Mile Sampling Areas

Gross Density	Lot Size	Total Lots	Lots Occupied	Lots occupied as percent of total lots
over 3.5 people per acre	under 1 acre	985	638 (87%)	65
	1 - 5 acres	104	94 (13%)	90
			100%	
1.2 - 3.5 people per acre	under 1 acre	406	217 (66%)	53
	1 - 5 acres	157	111 (33%)	71
			99%	
0.3 - 1.2 people per acre	under 1 acre	307	98 (48%)	32
	1 - 5 acres	122	94 (46%)	77
			94%	

III. EFFECTS OF SPRAWL:

We have seen what sprawl is and how it occurs. Is it a bad thing? Is it a problem of sufficient importance to cause much concern?

Sprawl can be measured by two yardsticks, one social, the other economic. For one the question would be "Does sprawl produce the kind of communities we want?"; for the other "What does sprawl cost?"

No attempt will be made to answer the first question. Anyone familiar with sprawl areas in the Lower Mainland would probably agree that they are not adequately provided with schools, parks, shopping centres, public transit, paved roads and sewers. Residents in these areas themselves are among the first to admit that their services are inadequate and constantly press municipal councils for their improvement. This fact is not in question.

We come then to the second question, "What does sprawl cost?"

( ) Sprawl and Utility Costs:

Utilities such as roads, ditches, water mains, sewers power and gas lines have one important factor in common - the cost to the property owner of providing them increases as the frontage increases.

How does sprawl affect the economic provision of utilities? To answer this a square-mile sprawl area in North Surrey was examined. This area had 250 occupied lots and a gross density of 1.4 persons per acre. The square mile is at present served by 55,000 lineal feet of road which is equivalent to an average of 220 feet per household.

With ordinary layout, and without reduction of lot size, the 140 urban-size lots involved could have been adequately served by only 80 feet per household, that is almost one third of the actual case.

The per capita cost of public works in areas of varying densities in four separate municipalities are shown in the graph on page 19. (Detailed figures are available in Appendix B.) These costs, though they vary from municipality to municipality, have a marked tendency to decrease as density increases. Exceptions to this trend can be seen in several of the municipalities but they can be accounted for by ground conditions and subdivision design.

The general rule is again illustrated by the following analysis of water supply costs in several water areas in Surrey:

Area	Density	Annual Cost per Household
Bridgeview	14.4	$ 29.50
West Whalley	5.7	44.90
Kennedy	2.35	81.20

(b) Sprawl and Municipal Economics:

It would seem to be a valid general rule that costs per household increase as densities decrease. This immediately raises another question. If different areas involve different costs, do they produce corresponding yields from rates and taxes? In other words, do they bear their own cost burdens?

To answer this question an intensive examination was made of the expenditure-revenue picture of areas of varying densities in four municipalities of the Lower Mainland. The intention of this examination was to discover, if possible, how much it cost the municipalities to provide services to farm, sprawl and suburban areas and how much revenue the municipality received in turn from these areas.

(1) Statistical Analyses:

The mechanics of the study, being rather detailed, have been relegated to the appendix.* In brief, however, it may be said it was carried out in two stages. In the first, all costs and revenues were evaluated as they actually occurred. In the second, costs and revenues were adjusted to eliminate certain factors which might distort or obscure the specific end which is being sought, namely the effect of density alone on municipal economics. Specifically these factors were local variations in value of houses, in the proportion of school children, in the proportion of social assistance cases, and deficits caused by local improvement systems which were not self-supporting but required subsidy from general revenue. It is believed that the adjusted analysis gives a true picture of the effects of low density development alone.

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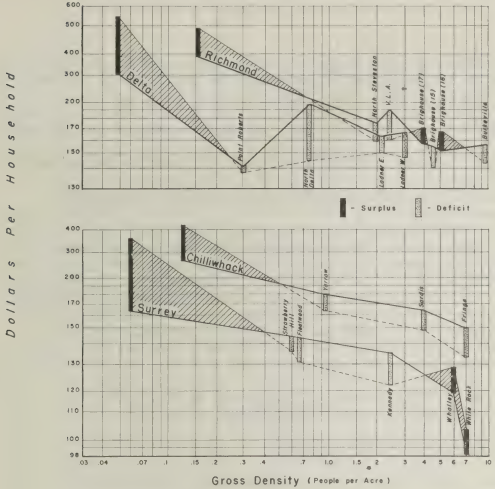
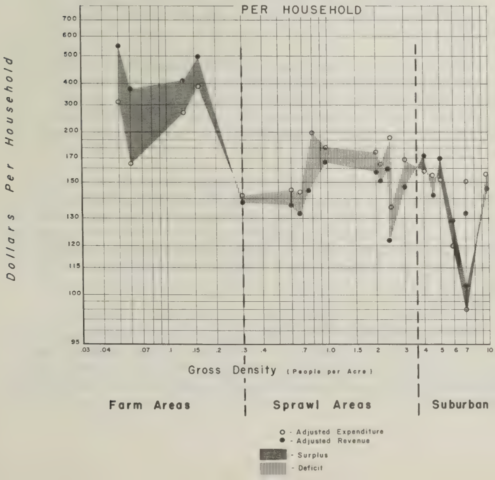
*Appendix A

ADJUSTED REVENUE - EXPENDITURE TRENDS



ADJUSTED REVENUES AND EXPENDITURES
PER HOUSEHOLD



In brief this analysis showed that development in the areas studied could properly be grouped in three categories:

1. Farm areas: density less than 0.3 people per acre;
2. Sprawl areas: density 0.3 to 3.5 people per acre;
3. Suburban areas: density more than 3.5 people per acre.

It also showed that, on the average, farm areas paid 50 percent more in taxes than they received in services and sprawl areas paid 12 percent less than they received. Suburban areas showed variations between surpluses and deficits, but after qualitative analysis it is shown later that suburban areas are normally capable of at least paying their way and often of providing a surplus of revenue over expenditure.

These findings are illustrated by the graph of adjusted revenues and expenditures on page 16.

(2) Interpretation of Analyses:

1. Farm Areas (density less than 0.3 people per acre):

The average size of holding in this group is over 12 acres. Full-time farming provides the major source of income.

Municipal expenditures per household in every case are the highest of any of the types of land holding. The major cause of this is low density which means that the mileage of roads and ditches to be maintained by each household is very large, and costs are correspondingly high.

However, because of the large amount of land per household the municipal tax base is also high, and revenues in every case produce a large surplus. These surpluses assist considerably in reducing the taxes required from other parts of the municipality, particularly in areas where large scale farms represent the bulk of the development, as in Delta and Chilliwhack.

The farm area in Delta produces an extremely large surplus per household. This is the result of large holdings, 71.4 acres per household, in Delta, compared to 35.0 acres per household in Richmond.

Revenue per acre in Delta is actually much lower, $6.30 per acre, as compared with $14.00 per acre in Richmond. The high revenue per acre required in Richmond is probably due to the amount of sprawl development in that municipality compared with Delta.

2. Sprawl Areas (density 0.3 to 3.5 people per acre):

Since sprawl areas represent stages of transition between farm land and suburban development they exhibit considerable variety. They include sections which are composed almost exclusively of small holdings from 1 to 10 acres in size, and others where 70% of the lots are below one acre but where only 53% of these lots are occupied.

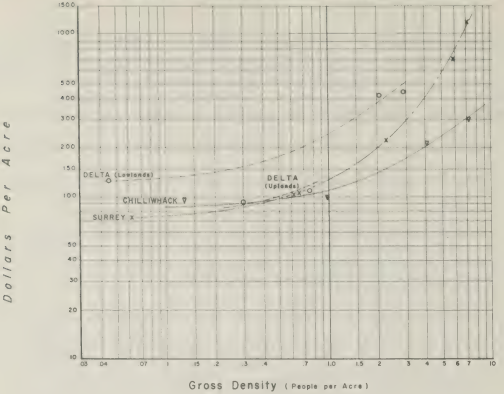
Compared with farm areas the sprawl areas have considerably higher densities. The length of roads, ditches and watermains required to service a household are therefore lower. Consequently expenditures per household fall well below the level required in farm areas. On the other hand revenues also drop, and drop so sharply as to produce considerable deficits in every sprawl area examined. These consistent deficits in municipalities with widely differing policies and levels of service suggest that deficits would occur in all cases where densities are of this order.

Deficits might be due to two major causes - either expenditures are too high or revenues too low. Per-household expenditures are higher than in areas where the density is greater, but they are lower than in sections where the density is less. In other words expenditures are about what they might be expected to be. Revenues, however, are not much above those received from areas of suburban density. Why should this be so?

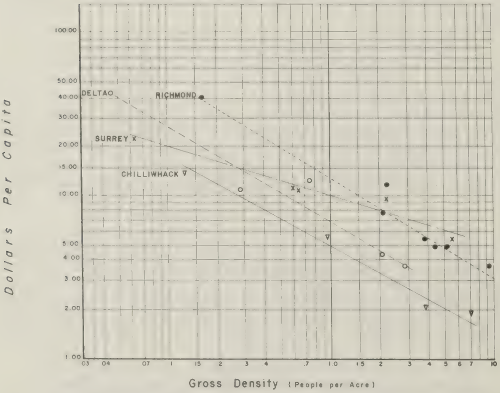
The two major factors in revenue are the assessed values of improvements and land. Improvement values have no relationship to density. both good and poor homes are to be found in all types of area. Deficits in the sprawl areas are large even when home values are brought in line with the better areas in the municipality.

The real reason for deficits in sprawl areas is the low assessed value of land. At the lower levels of the density range, particularly below 1.2 people per acre, much of the land is being used for agricultural purposes, often on a part-time basis, and its market value is close to the level of agri-

ASSESSED VALUE OF LAND PER ACRE



PER CAPITA COST OF PUBLIC WORKS



PUBLIC WORKS EXPENDITURES INCLUDE ONLY CONSTRUCTION AND MAINTENANCE OF ROADS, BRIDGES AND DITCHING. THE DIFFERENCE BETWEEN MUNICIPALITIES MAY BE PARTLY EXPLAINED BY THE FOLLOWING TABLE:

Gravel Roads as % of Total Municipal Roads	CHILLIWHACK	77.6 %
	SURREY	74.0 %
	DELTA	40.3 %
	RICHMOND	9.1 %

cultural land. The assessed value per acre is therefore only a few dollars more, or in some cases (in Delta for example) a few dollars less than in large farm areas.* But though land values are comparable with those in agricultural areas the size of the lots is much smaller and consequently the tax base and the revenue are much less.

At the upper end of the range of sprawl densities, from 1.2 to 3.5 people per acre, the majority of the holdings have been broken down into lots of urban size, though many remain unoccupied. Land values in these areas are three to four times higher than agricultural land values but they are still only half as high as suburban land values (areas with a density over 3.5 per acre).* In other words, there seems to be a definite relationship between assessed land values and density. While land remains in acreage (even less than 5 acres) it tends to be valued as farm land, but once acreage lots are split up into residential building sites, land values increase markedly. However, this increase is not automatic. It must bear some relation to actual demand and market values. In Kennedy, for example, there are a considerable number of urban sized lots, but only 53% of these lots are occupied and land values in consequence are low. Scattered urban development does not produce high land values. A residential concentration above about 3.5 people per acre seems necessary before real urban values will occur. Since the assessed land value per acre in areas of sprawl is not high, and the size of the holdings is not large, tax returns are small, being little above those of urban areas. But densities are relatively low and the expenditures required are substantial, so that deficits are produced.

The only way in which areas of sprawl density could be made to pay their way would be if land values were to approach those of urban residential areas. This may sometimes occur naturally due to fine views or some other asset, as in the case of Panorama Ridge in Surrey. It may also occur in municipalities of limited size in relation to the amount of development and the demand for land. This may be the case in municipalities such as Burnaby, North Vancouver and West Vancouver. In any other circumstances sprawl is an inevitable burden to the municipality.

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*See graph opposite and Appendix B for assessed value of land per acre.

5. Suburban Residential Areas (density over 3.5 people per acre):

Per-household expenditures continue to drop in suburban areas as the density increases, and were the lowest in their municipalities. There was only one exception - per-household costs in Bridgeview (Surrey) are on a par with costs in sprawl areas. This is due to the method of allotting expenditures used in the study. Many expenditures were necessarily distributed on a per capita basis. Household expenditures were computed by multiplying the per-capita expenditures by the number of people per household. In Bridgeview the number of people per household was the highest for the municipality, 3.92 people per household.[*] The size of expenditures in this area reflects this situation, but per capita costs are low and in line with other urban areas in Surrey.

While expenditures in suburban areas continue to drop, revenue per household holds steady, and in many cases is above that of the sprawl areas. The more satisfactory revenue picture is due to the rapid rise in assessed land values under urban residential conditions. Assessed land values per acre are generally 7 to 10 times the value of farmlands or acreage.[‡] These values reflect market conditions where urban residential lots will sell at much the same price as an acre of land in larger blocks. But this condition seems to occur only after the density reaches 3.5 people per acre, or where it might be expected to reach this stage in a relatively short time, as in a rapidly developing subdivision. Under these conditions of lowered expenditures and bouyant revenues it is to be expected that suburban areas can pay their way or produce a surplus.

Why, then, do a number of suburban areas not pay their way? The answer is that in all deficit-producing suburban areas assessed land values do not rise to the level which their density would warrant. Low assessed land values may be due to several causes:

(i) In Bridgeview, Surrey, and Section 15 of the Brighouse urban area in Richmond the reason is the poor physical condition of the area. Both areas are peat bogs with attendant problems of foundations and drainage. Poor land attracts low-value homes which in turn keeps land values low.

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[*] The extremely low expenditures per household in White Rock are also the result of these methods. White Rock has 2.14 people in the average household.

[‡] See graph on page 19 and Appendix B for assessed value of land per acre.

(ii) In Burkeville, Richmond, ground conditions are as good as in any other section of the municipality, and the low land values are the result of low improvement values. These in turn are due to the substandard quality of the homes, which were built to provide wartime housing for workers at the Boeing plant.

(iii) In the Chilliwhack urban areas, land is assessed at little more than 3 times the value of agricultural land, though there are no physical problems and housing developments are of average quality or better. The low assessed value of land in Chilliwhack may be due to (a) relatively low market values for urban land outside the metropolitan area, or (b) an assessment policy which assesses urban land below normal values.

One other condition, already noted, can produce a deficit, that is local improvements which require subsidies from the municipality. For example, if the deficits on the sewerage system in White Rock were included in expenditures a sizeable deficit would result.

In summary, suburban areas can be self-supporting or produce a surplus if land values are normal and homes are of average quality.

Whether these results would apply in all situations is not known. In urban areas such as Vancouver and New Westminster many new factors arise. The scale of civic expenditures is different and scattered urban development and small-holding areas do not constitute an important segment of the municipality.

The study areas were examined in 1954. Since that time the Provincial Government has instituted an assessment equalization policy. Would the change in assessment practices affect the results of this examination?

Expenditures, of course, would be unaffected. It is also unlikely that as yet revenues would be greatly affected. Assessments are being raised equally throughout the municipalities to bring improvements to 60% of the 1953 replacement values and land to 60% of current market values. Since assessments are being raised equally throughout the municipalities the position of one area in relation to another would normally be unchanged.

It would require a change in the proportions of the tax load borne by land and improvements to affect the results of this study. This would be possible if the present system were to remain rigid for long periods while real estate prices rose, that is, if assessed land values, which are tied to current costs, rose, while improvement values, which are related to 1953 prices, remained unchanged. Those areas where land formed the greater part of the tax base, such as the farming areas, would then carry a greater tax load, while urban areas where improvements represent the large percentage of the tax base, would pay less. This would only occur, however, if assessments remained on their present basis for some considerable period.

IV. PROPOSED SOLUTIONS:

The first solution which might be considered is some way of increasing tax revenues in sprawl areas. (i) Since improvements constitute the larger percentage of the tax base in urban areas, increasing the percentage taxable for improvements would principally affect the urban areas, which in many cases are already producing a surplus. (ii) If it were possible to raise assessments directly in the sprawl areas revenues could be increased. But assessments must by law be based on fair market values and it is believed that this is actually the case in most of the municipalities examined.

The possibility of increasing revenues in deficit areas alone is therefore limited and other solutions must be considered. In particular, attention should be given to the more logical and constructive possibility of decreasing expenditures in sprawl areas.

This study suggests that three general principles will lead to a solution of the sprawl problem.

1. Active encouragement of compact, self-supporting residential areas.
2. Discouragement of deficit producing sprawl.
3. Preservation of large farms.

How could these general principles be applied in the three types of areas - sprawl areas, suburban areas and farm areas?

1. Sprawl Areas:

These are the critical areas. At present, in order to meet their expenditures they require whatever surplus is available to the municipality from industrial and commercial developments as well as surpluses from agricultural and urban residential zones. It is estimated that sprawl areas produce an annual deficit of $80,000 in Richmond and $120,000 in Surrey.*

Can sprawl be halted? Between 1949 and 1954 approximately 20 percent of new home developers sought lots larger than 1 acre. To the extent that this represents a real and informed desire, some degree of sprawl will continue if it is granted that somehow and somewhere, people should be enabled to build on the size of lot that they desire. This suggests that there should be areas specifically designated for low-density development.

It may seem paradoxical that one way to prevent sprawl would be to deliberately create zones where only acreage holdings would be permitted. It is true that they would produce deficits but at least these would be fewer and smaller than if the present chaotic process is allowed to continue. In addition it would presumably be recognized that in such areas the municipality would not be committed to providing urban services and an attempt could be made to hold services and costs to a minimum.

> It is recommended that acreage holding zones be established with minimum lot sizes of perhaps 1 acre. Services in these zones should be held to a minimum.

The remaining impetus to sprawl will come from those who wish to locate on parcels of less than 1 acre. It has been shown that denser areas are more attractive for new developers and that there is a natural tendency for concentration. It would apparently not be working contrary to the natural tendency of either owner-builders or speculative builders if, through zoning, the municipalities attempted to reinforce this trend toward concentration. Its effects on the municipality's financial prospects would, however, be considerable. For example, under the present zoning by-law people desiring urban lots in North Surrey are permitted to locate anywhere within a 40 square mile "urban residential" zone. The choice is so wide as to put virtually no restriction on the location and development of urban lots. A normal year's growth, at current rates, in this vast area would only increase the overall density by about 0.1 people per acre, so that it would take many years for the area to develop self-supporting densities. The Regional Planning Board originally recommended an urban residential zone of about 10 square miles - which was, if anything, too large. Concentrated in a zone of this size the yearly growth would raise the overall density by almost 0.5 people per acre, which would soon result in self-supporting densities.

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*These figures should not be confused with those quoted in the "popular" report, Urban Sprawl. The figures in the popular report are the amounts that would have been saved if the homes on lots less than one acre had been grouped more compactly. They are based on costs alone. On the other hand the figures quoted above are actual deficits in the sprawl areas of the two municipalities, that is, the amounts by which revenues in these areas fall short of expenditures. They are therefore two completely different sets of figures and can not be compared.

There is another benefit which should result from urban zones of realistic size, namely that land remaining in acreage within the urban zone would be assessed as residential, and there would be in any urban residential zone in Surrey or Richmond considerable areas of acreage. Within an over-large urban residential zone no real urban values are established. Much, probably most, of the land will be used for small holdings for a period of 20 to 30 years. The assessed value of such land would have to be based on this fact and would remain close to the level of agricultural values. On the other hand, within a realistic residential zone land would be put to residential use within a relatively few years and land assessments would reflect this fact by approaching urban values, even though the land remained in acreage. In this way it would be possible for the acreage holdings included within the urban zone to go a long way toward paying their own way. Although this would result in the interim in increased taxes for the acreage holder, he would on the other hand be able to recoup himself by the relatively great appreciation of the land value when his land became ripe for building within a very few years.

In short, realistic urban zones would not only assist the formation of concentrated urban development with its resultant economies, but should also assist acreage holdings included within them to meet or eliminate their deficits.. It should be stressed that this could only occur within an urban residential zone of realistic size, that is, one which gave real evidence of reaching urban density within a relatively short time.

There would still be the problem of the present undeveloped lots scattered throughout the municipalities in anticipation of future development. They constitute a problem which can scarcely be avoided and which might slow somewhat the process of urban concentration. However, with a well defined, compact urban zone it might at least be possible to resist their demands for urban services until such time as the urban zone required expansion.

> It is recommended that urban residential zones of realistic size be established capable of being filled to urban densities within a relatively short period, say five years.

A decision to deprive the relatively large number who live in sprawl areas of their right to continue subdivision of their holdings into urban lots, in the interests of the whole community would not be easy for any municipal council. Thus outside support for this proposal would be desirable. This might be found in the fact that the Provincial Government has a stake in the problem. It has constantly increased its grants to the municipalities, but after each increase the municipalities still claim they have emerged poorer. This is because, in part at least, these grants have gone to provide the subsidies required by sprawl areas. If the Provincial Government wishes to stop pouring money down this bottomless pit it should ensure that new development is as orderly and economical as possible. This could be assured by amendments to the Town Planning Act requiring rapidly developing municipalities to define urban residential zones which could be expected to reach an economic density within a period of say 5 years. Such zones could be subject to constant review so that changing trends in rate and direction of development could be accommodated. This course would to a large extent relieve municipal councils of a very difficult task while still largely preserving the principle of local autonomy.

> It is recommended that the Provincial Government, while it is engaged in redrafting planning and other municipal legislation, should seek the power to require any municipality to prepare plans on the following basis:
>
> "That zoning schemes shall be prepared and administered to allow for not more than 5 years' normal residential growth at any time. Such schemes shall be designed to promote maximum economy and efficiency in developing and servicing the area, and no improvements programs shall be undertaken unless related to such a scheme."

2. Suburban Areas:

Compact development is not in itself sufficient. It must also be largely self-supporting.

(a) One cause of deficits in relatively high-density areas is the settlement of unsuitable land, such as peat bogs. These areas are unusually expensive to service and maintain from the municipality's viewpoint, especially in relation to the low-tax value of the homes likely to concentrate there. For this reason new subdivision and building should be prohibited, and in due course the redevelopment of existing areas might be considered.

(b) Another cause of deficits is low value of improvements on otherwise suitable sites, as in Burkeville, in Richmond. Since this was a federal emergency development it did not have to comply with munifipal building by-laws but it illustrates the consequences of low-standard construction.

(c) One factor contributing to low values is the existence of extremely small lots, of say 25 foot frontage. Such lots tend to depress values of land and improvements.

(d) Deficits can be caused by local improvement schemes requiring subsidy from general revenue. If deficits are to be avoided in urban areas such services should be self-liquidating.

The conclusions to be drawn from these observations would, of course, apply to any type of development, and are worth noting;

> Housing should be permitted only on good ground, on lots of adequate size, and should not be supplied with extra services which it cannot in large measure pay for directly.

These measures, since they are intended to prevent deficits in suburban areas, are of necessity negative in approach. They should be complemented by positive programs to make suburban areas more attractive to the home builder, by supplying them with urban services such as sidewalks, street lighting and sewers. This implies a carefully planned capital works program, which would provide services while not placing too great a burden on the municipality.

Relatively high density is only one prerequisite of self-supporting residential development. It must also be:

1. Located on good ground;
2. On lots of adequate size;
3. Of sound construction;
4. Not supplied with extra services which cannot in large measure be paid for directly.

A sound program of capital expenditures should be undertaken in these areas to make them more attractive for residential development.

3. Large Farm Areas

It has been seen that large farm areas are a great asset to any municipality, providing a surplus which is large in all cases, and in some instances sufficiently large to reduce the tax burden considerably throughout the remainder of the municipality.

Under these circumstances it is in the best interest of the municipality to retain large farm areas as long as possible. In the ideal situation they would be held until they could pass directly into compact urban residential use, by-passing costly low-density development. To do this the farming areas would have to remain in large blocks until the demand for urban residential lots was sufficient to guarantee that they would be developed to urban density within a few years.

The size at which the transition from deficit areas to surplus-producing farming areas occurs is about 10 to 12 acres. On this basis a minimum lot size of 10 acres in the farming areas would effectively preserve these areas until such time as the need for urban residential land required their subdivision into building lots.

Farmers would not be enthusiastic about such a provision if its only objective were to preserve a surplus-producing area for the benefit of the remainder of the municipality. It is true that it would have this effect, but it is also intended to prevent the kind of development which inevitably increases the farmer's taxes.

In addition relatively few farmers could actually be affected by such a provision, since it would in any case be possible for only a few farmers to subdivide successfully at the same time. The restrictions of agricultural zoning would merely prevent one farmer from subdividing prematurely and thus placing an increased tax burden on those remaining. There would be no question of holding land in agricultural production in perpetuity. When the demand for residences become sufficient they could properly be rezoned for residential use.

At present the tax burden on the farmer is relieved by granting exemptions on farm buildings up to an assessed value of $5000 on farms 5 acres or larger in size. Since farms from 5 to 10 acres in size are within deficit zones, this privilege should really apply only to farms 10 acres or larger in size. When thus applied to farms within an agricultural zone it might be sufficient to allow the $5000 exemption to apply to dwellings as well as farm buildings, thereby lowering appreciably the farmer's tax burden. Such a provision would presumably require the revision of the Municipal Act.*

Clearly the proposed relief from municipal taxation should only apply to farm holdings included within an agricultural zone. Otherwise the municipality would be granting tax relief to farmers who might enjoy the concession for only a year or two and then subdivide. The municipality and the large farm must both give and receive. The municipality gives up a certain amount of taxes and in return it is assured that for many years a substantial area will require little in the way of new services. The farmer gives up the right to immediate subdivision and in return obtains tax relief.

> It is recommended that farm zones be established in suitable areas with minimum lot sizes of, say 10 acres. The farms included within these zones should be granted tax relief, perhaps by an extension of the exemptions for improvements.

Detailed solutions, such as the size and location of various zones, will vary from municipality to municipality and can only be effective if based on competent planning advice. Many details, such as capital works planning and the timing of new urban residential zones, can be handled most effectively when planning becomes a built-in municipal function and a municipal planning officer is available on a day-to-day basis.

> It is recommended that the municipalities affected by sprawl consider the appointment of a municipal planning officer, or alternatively, that they

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*Municipal Act S.236 (k)

make full use of the local planning service of the Lower Mainland Regional Planning Board.

* * * *

The solutions recommended in this report may be difficult but the alternatives are plain. Sprawling development can be allowed to continue. If new industries and commercial developments enter the municipalities in sufficient numbers they may be able to pay the costs attendant upon sprawl. If increased grants are obtained from the Provincial Government they too could be used to pay for sprawl. Failing this, the costs will fall primarily upon the large farmers and urban dwellers and only lastly on those who cause them.

Furthermore, only general policies have been dealt with here, and these would, of course, require proper application based on detailed studies of each municipality. Thus the solutions suggested would only be the first step. But it is quite clear that unless some such steps are taken there will be no effective solution, and chaos and waste will continue their ravages. It would seem that for any progressive and self-respecting people there can be only one response to this alternative.

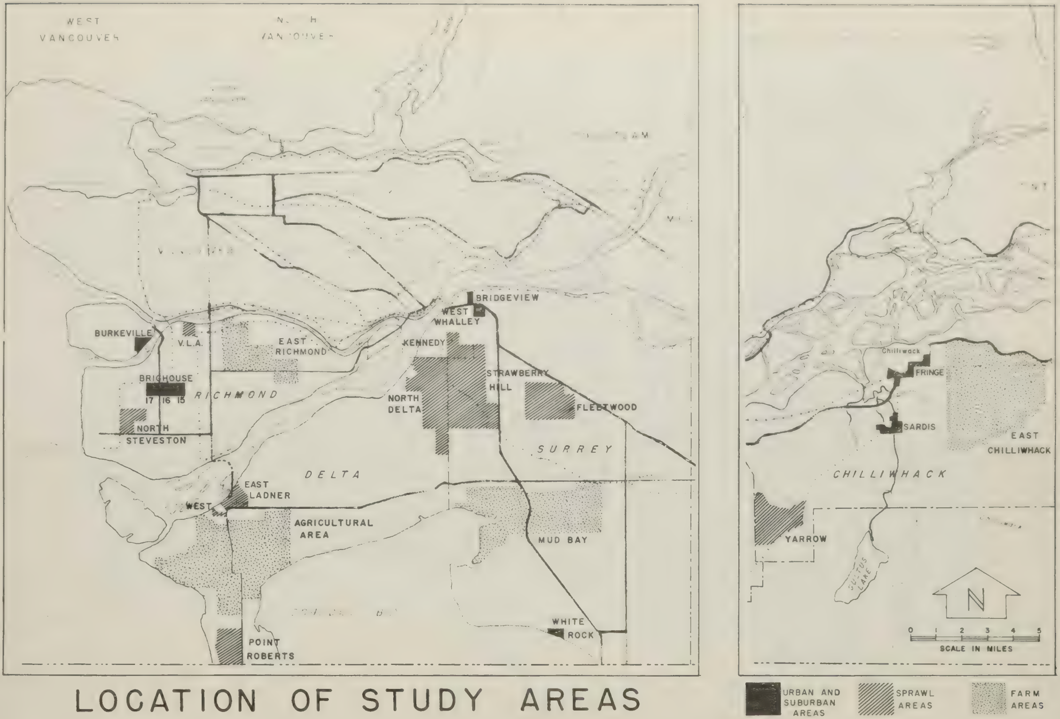
APPENDIX A

Analysis, first stage:

Several areas which exhibited significantly different densities and development patterns were selected on the basis of available information on lot sizes, population distribution and land use. An attempt was made to select areas which were characteristic of the major types of land settlement. The areas varied in size from a minimum of 60 acres to 15 square miles. The location of these areas may be seen from the map on page 35.

Once an area was selected the following information was obtained:

1. The number of households and the assessed value of land and improvements were obtained from assessment rolls;
2. The number of people per household in each enumerating district was obtained from the 1951 census. (An enumerating district, which is the smallest unit of measurement for census data, contains approximately 1000 people.) By multiplying the number of people per household and the number of households a fairly close estimate of the population in each area could be made;
3. A similar method was used for estimating the population of the municipality as a whole, except that the number of dwelling units added since 1951 were obtained from building permit statistics;
4. A block by block count of the number of school children within each study area was made from school board records, and the location of each elementary and secondary school child was plotted;
5. From the files of the municipal welfare departments the number of people receiving social assistance in each study area was obtained;
6. The number of miles of road within the study area was calculated from municipal maps.



LOCATION OF STUDY AREAS

To allot revenues and expenditures to the study areas this material was used as follows:

Revenue:

(a) The revenues from municipal property taxes were obtained by applying the mill rate to the taxable assessed values for the area.

(b) Revenue from penalties, licenses and sundry taxes, permits and fees, police fines and miscellaneous sources were allotted to each area on a per capita basis.

(c) Provincial government grants were distributed on a per capita basis.

(d) Where appropriate, surplus revenues from water systems were allotted to the study areas on the basis of the number of households in the study area as compared to the number of households in the whole water area.

Expenditures:

(a) The following expenditures were allotted to the study areas on a per capita basis: General administration, policing and administration of justice, libraries, donations and grants, hospitalization, administration of social welfare and public works, municipal land improvements, debenture redemptions (unless the debenture expenditure could be related to a particular area in a municipality) parks and cemeteries, capital expenditure and miscellaneous.

(b) The costs of social welfare (other than administration) for each area were allotted by the number of social assistance cases in each area. Only the actual cost to the municipality (about 20% of the total) was included.

(c) The charges for education were calculated by applying the cost to the municipality of educating each elementary and secondary pupil (obtained from the School Board) to the number of children within the study area. School costs met by the Provincial Government were excluded from expenditures.

(d) Public works expenditures were distributed in the following manner:

Public works expenditures were obtained for the smallest possible areas. In Surrey this was

> on the basis of wards (seven altogether); in Delta expenditures were available for North Delta and the remainder of the municipality; in Richmond and Chilliwhack figures for the whole municipality were used. The number of miles of raod within each study area was obtained from an examination of municipal maps. The road mileage within the study area was calculated as a percentage of the total road mileage of the ward, area, or municipality. Public works expenditures were then allotted to the study areas on the basis of this percentage. Provincial Highways were not included in the calculation of road mileages in study areas. They were not considered chargeable to the area since they, by definition, benefit more than the people living within the area and are maintained at the expense of the Provincial Government.

The basic municipal services in all study areas within a municipality were identical. Certain areas obtained extra services such as water, sewers, fire protection, garbage collection and street lights. In all cases these services were provided on a local improvement basis, that is, the costs of the services were charged directly to the area involved. In certain cases these local improvement districts required a subsidy from the general revenue of the municipality. In this case the amount of subsidy from general revenue was calculated as a cost to the area involved. Where the service produced a surplus to general revenue it was considered to be revenue from the area.

As a result of this examination the areas were separated into three categories:

Farm Areas: density less than 0.3 people per acre;*

Sprawl Areas: density between 0.3 and 3.5 people per acre;

Suburban Areas: density more than 3.5 people per acre.

These limits were determined on the basis of two criteria: (1) by plotting the revenue-expenditure balance against density in several municipalities; (2) by plotting the frequency distribution of densities throughout the whole of two municipalities. Both methods suggested that the limits chosen are natural breakpoints. Nevertheless these limits cannot be applied with complete certainty or precision, and borderline cases in particular need to be examined qualitatively as well as statistically before being assigned to one category or another.

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*Note: All densities are gross densities.

The results of this analysis were as follows:

I. Actual Revenues and Expenditures Per Household

Area	Density	Revenue	Expenditure	Surplus	Revenue / Expenditure %
	People/acre	$	$	$	%
FARM AREAS					
Delta	0.05	464	286	178	162
Surrey	0.06	266	188	78	143
Chilliwhack	0.13	321	285	36	112
Richmond	0.16	400	311	89	129
SPRAWL AREAS				Deficit	
Strawberry Hill (Surrey)	0.6	134	207	73	65
Fleetwood (Surrey)	0.6	132	145	13	91
Point Roberts (Delta)	0.3	110	166	56	66
North Delta	0.7	138	225	87	61
Yarrow (Chilliwhack)	0.9	163	191	28	85
Kennedy (Surrey)	2.3	106	173	67	62
Ladner East (Delta)	2.0	151	158	7	95
Ladner West (Delta)	2.9	148	148	-	100
North Steveston (Richmond)	2.0	159	198	39	80
V.L.A. (Richmond)	2.3	163	275	112	59
SUBURBAN AREAS				Surplus + or Deficit -	
Whalley (Surrey)	5.7	128	114	+ 14	112
White Rock (Surrey)	7.0	103	134	- 31	77
Bridgeview (Surrey)	14.4	116	132	- 16	88
Brighouse (Sec. 17, Richmond)	3.9	172	147	+ 25	117
Brighouse (Sec. 15, Richmond)	4.3	142	152	- 10	93
Brighouse (Sec. 16, Richmond)	5.0	170	159	+ 11	107
Burkeville (Richmond)	5.3	146	184	- 38	79
Sardis (Chilliwhack)	3.33	144	151	- 7	95
Fringe (Chilliwhack)	7.0	134	136	- 2	99

The statistical averages for the three categories are:

Revenues as Percentage of Expenditures:

Farm Areas	136%
Sprawl Areas	76%
Suburban Areas	96%

The farm areas then, produce a considerable surplus of revenue over expenditure: the sprawl areas fall far short of paying for the municipal expenditures they require; and the suburban areas, on the average, come close to paying their way.

Analysis, second stage:

The question then arises, can we be sure that this picture is due to variation in density alone and not other causes? The tables listed previously give the actual revenue-expenditure relationship in the areas examined, that is, the situation as it actually exists. Now which variables, other than density, can and should be eliminated?

Those that could be calculated were these:

1. Variation in value of households:

   It is clear that a low value household will produce less revenue and be less likely to pay its way than one of high value. But our objective is to see if houses of the same value could, by a variation of area density alone, be made to produce a surplus or create a deficit. Therefor tax revenues from the assessed values of improvements were brought to a common level in all municipalities except Richmond, to eliminate the effect of this variable. Material was not collected to permit this in Richmond, where studies were undertaken mainly to confirm trends apparent in other municipalities. But it is the opinion of Richmond municipal officials that only three areas deviate to any extent from the municipal average. Those are all urban areas: Brighouse (Sec.15), which is on a peat bog and has homes of lower than average value; Burkeville, a wartime housing development with home values below average values, which produces a considerable surplus though its density is low for an urban area.

   In the remaining areas the average value of assessed improvements per household were equalized to bring them in line with the best suburban households. The bases to which values of homes were adjusted were – in Surrey, West Whalley: in Delta, Ladner West; and in Chilliwhack, the city fringe area.

2. Variation in the number of school children:

The proportion of children attending school varies from one area to another. Examination of the tables in Appendix B shows that the school child ratio tends to increase as density decreases. In the foregoing analysis of actual costs the various areas were charged according to the number of children they sent to public schools. It was felt, however, that education costs should be spread across the municipality as a whole. Thus education costs were calculated and allotted on an overall per capita basis.

3. Variation in social assistance cases:

In the tables of actual costs, social assistance charges were allotted by the number of cases in the area. There was no relationship between density and the number of social assistance cases, and it was felt that this expenditure also should be borne by the municipality as a whole, that is, on a per capita basis.

4. Local improvement charges:

In Surrey a special variable existed in the shape of sums paid out of general revenue to cover deficits incurred by Local Improvement Districts. These deficits have a very direct relationship to density as can be seen from the following table:

Annual Subsidy From General
Revenue in Water Districts

Area	Density	Subsidy Per Household
Bridgeview	14.4	Nil
White Rock*	7.0	Nil
West Whalley	5.7	$ 6.60
Kennedy	2.35	41.00
Strawberry Hill	0.65	41.00

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*private system.

In addition White Rock has a sewer system which requires a subsidy from General Revenue amounting to $36.20 per household.

It was decided not to include these charges in the adjusted expenditures, since Local Improvement Districts are supposed to pay their own costs without subsidies from the municipality. This adjustment changes the picture considerably in several areas in Surrey. In all other municipalities examined, water systems are supported by their rates and require no subsidy from general revenue.

5. There were a number of other variables encountered in this examination, such as physical conditions, differing scales of expenditures, variations in assessment practices and municipal policies for which no statistical adjustment could be made. It should also be noted that the proportion of different types of development in a municipality affects the deficit picture. If a municipality consisted only of sprawl areas they would have to pay their way (ignoring other sources of surplus such as industrial areas), whereas in a predominantly farming municipality a small deficit area might have huge per household deficits without noticeable effect on the overal tax rate or tax revenue. It is therefore impossible to compare directly similar areas in different municipalities. However, any persistent trends exhibited by similar areas in such widely differing municipalities are all the more significant.

In summary, the adjusted revenues and expenditures eliminate the effects of variations in assessed values of improvements, of varying proportions of school children and social assistance cases, and of subsidies from general revenue to local improvements. The following tables show the results of these adjustments.

II. Adjusted Revenues and Expenditures Per Household

Area	Density	Revenue	Expenditure	Surplus	Revenue / Expenditure %
	People/acre	$	$	$	%
FARM AREAS					
Delta	0.05	451	264	187	172
Surrey	0.06	272	166	106	164
Chilliwhack	0.13	313	237	76	132
Richmond	0.16	400	297	103	134
SPRAWL AREAS				Deficit	
Point Roberts* (Delta)	0.3	138	142	4	97
Strawberry Hill (Surrey)	0.6	137	145	8	94
Fleetwood (Surrey)	0.6	133	144	11	93
North Delta	0.7	146	200	54	73
Yarrow (Chilliwhack)	0.9	167	180	13	92
Kennedy (Surrey)	2.3	123	135	12	91
Ladner East (Delta)	2.0	152	166	14	91
Ladner West (Delta)	2.9	148	169	21	88
North Steveston (Richmond)	2.0	159	176	17	90
V.I.A. (Richmond)	2.3	163	194	31	84
SUBURBAN AREAS				Surplus + or Deficit -	
Whalley (Surrey)	5.7	128	120	+ 8	106
White Rock (Surrey)	7.0	105	98	+ 7	107
Bridgeview (Surrey)	14.4	132	149	- 17	89
Brighouse (Sec.17, Richmond)	3.9	172	159	+ 13	108
Brighouse (Sec.15, Richmond)	4.3	142	156	- 14	91
Brighouse (Sec.16, Richmond)	5.0	170	153	+ 17	111
Burkeville (Richmond)	9.3	146	158	- 12	89
Sardis (Chilliwhack)	3.9	148	167	- 19	89
Fringe (Chilliwhack)	7.0	134	151	- 17	89

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*Point Roberts (Delta) is not a true sprawl area. It falls on the boundary between farm and sprawl area and exhibits characteristics of both categories.

The adjusted statistical averages are:

Revenues as Percentage of Expenditures:

Farm Areas	150%
Sprawl Areas	88%
Suburban Areas	98%

In review it is seen that the overall picture remains much the same - the farm areas produce very large surpluses, the sprawl areas deficits, while urban areas occupy both deficit and surplus positions.

Since revenues and expenditures were adjusted to eliminate variables other than density it should now be possible to attribute these persistent trends to density factors alone.

APPENDIX B

NOTES ON STATISTICS OF STUDY AREAS

Table 2: Obtained by dividing the total assessed value of improvements by the number of households. This is total assessed value of improvements not taxable improvements.

Table 3: Obtained by dividing the total assessed value of land in the study area by the number of households.

Table 4: Obtained by dividing the total assessed land value in the study area by the number of acres.

Table 5: Obtained by dividing the total acreage by the number of households.

Table 6: From social assistance records.

Table 7: From school rolls.

Table 8: Obtained by dividing cost of public works by the number of people in the area.

Tables 9 - 14: Tables 9 to 14 show the steps taken to arrive at adjusted revenues and expenditures.

Table 10: Adjusted Revenue: Revenue per household has been increased or decreased by the amount necessary to bring the average assessed value of improvements in line with those of the base area. The base to which the areas have been adjusted are:

Delta : Ladner West
District of Chilliwack : The Fringe
Surrey : West Whalley

Table 12: Adjusted Expenditure (1): Shows expenditures with education costs distributed on a per capita rather than an actual basis.

Table 13: Adjusted Expenditure (2): Shows expenditures with education and social assistance costs distributed on a per capita rather than an actual basis. This is the final adjusted expenditure in Richmond, Delta, and District of Chilliwhack.

Table 14: Adjusted Expenditure (3): This is Adjusted Expenditure (2) (Table 13) less the amount received by Local Improvement Districts from General Revenue to meet deficits on sewer and water operations. This is the final adjusted expenditure in Surrey.

STATISTICS OF STUDY AREAS, 1954

AREA	(1) Gross Density per acre	(2) Assessed Value of Improvements Per Household	(3) Assessed Value of Land per Household	(4) Assessed Value of Land per Acre	(5) Gross Acres per Household	(6) Social Assistance Cases per 100 people	(7) School Children per 100 People	(8) Per capita Cost of Public Works	(9) Actual Revenue per Household	(10) Adjusted Revenue per Household	(11) Actual Expenditure per Household	(12) Expenditure per Household (1) Adjusted Expenditure	(13) Expenditure per Household (2) Adjusted Expenditure	(14) Expenditure per Household (3) Adjusted Expenditure
SURREY														
Bridgeview	14.4	$ 1150.00	$ 144.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$ 132.40	$ 150.60	$ 148.71	$ 148.71
White Rock	7.0	1695.00	374.00	[illegible]	[illegible]	1.43	[illegible]	[illegible]	[illegible]	[illegible]	134.00	134.80	134.28	98.08
West Whalley	5.7	1775.00	387.00	[illegible]	0.56	0.378	13.6	5.45	127.80	127.80	114.00	124.00	127.08	120.48
Kennedy	2.35	1090.00	312.00	[illegible]	1.40	0.244	18.0	9.75	106.00	123.10	172.80	173.00	175.91	134.91
Fleetwood	0.652	1745.00	516.00	105.00	4.91	0.578	20.0	11.40	132.50	133.35	145.00	142.00	143.88	143.88
Strawberry Hill	0.61	1650.00	534.00	100.00	5.3	0.227	25.4	12.10	134.00	137.05	209.30	183.30	186.05	145.05
Mud Bay	0.063	1525.00	3500.00	73.00	46.8	--	30.35	20.25	266.00	272.20	188.50	163.00	166.80	166.80
Municipality	--	1570.00	670.00	--	--	0.932	20.0	--	149.50	--	--	--	--	--
DISTRICT OF CHILLIWHACK														
Fringe	7.0	1573.00	156.00	295.00	0.528	0.855	14.7	1.83	134.00	134.00	136.00	153.00	150.92	--
Sardis	3.93	1460.00	214.00	220.00	0.975	--	16.1	2.09	144.50	147.90	151.00	160.00	166.68	--
Yarrow	0.935	1422.00	387.00	98.00	3.95	0.985	24.0	5.70	163.00	167.00	191.00	182.00	180.23	--
East Chilliwhack	0.13	1820.00	3360.00	91.20	36.75	--	24.4	14.10	321.00	313.00	285.00	230.00	237.15	--
Municipality	--	1790.00	1342.00	--	--	0.732	22.0	--	258.00	--	--	-	--	--
DELTA														
Ladner West	2.88	$2220.00	$ 523.00	$ 436.00	1.20	4.1	11.5	$ 3.55	$ 148.00	$ 148.00	$ 148.50	$ 180.00	$ 169.25	
Ladner East (Delta Manor)	2.03	2160.00	691.00	421.00	1.62	1.75	13.9	4.37	151.00	152.54	158.00	170.00	166.55	
North Delta	0.75	1890.00	501.00	106.00	4.68	1.75	23.3	13.00	138.00	146.50	225.10	203.10	200.25	
Point Roberts	0.298	1142.00	854.00	90.00	9.5	--	24.2	10.30	110.00	137.60	166.80	139.00	141.96	
Farm Area	0.0465	2700.00	9600.00	134.20	71.4	.295	21.0	43.80	464.00	451.60	286.00	261.00	264.45	
Municipality	--	2040.00	1818.00	--	--	1.04	19.6	--	208.00	--	--	--	--	
RICHMOND														
Burkeville	9.3	--	--	--	0.395	0.27	24.5	3.54	146.50	--	184.00	158.00	160.23	
Brighouse (Sec.16)	5.05	--	--	--	0.685	0.48	20.2	4.76	170.00	--	159.00	154.00	153.15	
Brighouse (Sec.15)	4.35	--	--	--	0.81	0.48	19.0	4.64	142.30	--	151.80	156.50	156.50	
Brighouse (Sec.17)	3.92	--	--	--	0.895	0.48	16.4	5.40	172.50	--	147.50	161.00	159.54	
V. L. A. (Sec.23)	2.33	--	--	--	1.59	0.54	33.2	11.90	163.00	--	275.00	194.00	192.39	
North Steveston (Sec.25,30,36)	2.04	--	--	--	1.81	0.41	22.6	7.50	159.00	--	198.00	176.00	176.25	
Agricultural Area, East Richmond	0.16	--	--	--	35.0	--	21.5	40.00	400.20	--	311.00	291.00	297.15	
Municipality	--	--	--	--	--	0.427	20.35	--	195.50	--	--	--	--	